

Abstract Submitted
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Vortex and Tendex Lines in Post-Newtonian and Black-Hole Perturbation Spacetimes¹ DAVID NICHOLS, YANBEI CHEN, KIP THORNE, AARON ZIMMERMAN, Caltech — We explore the behavior of frame-drag vortex lines and their vorticities, and tidal tendex lines and their tendicities (see above abstract by Thorne et al.) in analytic, dynamical situations — specifically, for a plane gravitational wave, for a binary system in the Post-Newtonian approximation, and for quadrupolar quasinormal modes of a Schwarzschild black hole. Using pictures of the vortex and tendex lines, and the Maxwell-like evolution equations for the electric and magnetic parts of the Weyl tensor, we show how dynamical near-zone vortex and tendex lines give rise to gravitational waves as one moves outward into the wave zone.

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